

WHAT IS CLAIMED IS:

1. A retaining ring to be fitted on a chemical mechanical polishing apparatus for semiconductor wafers, comprising:

a carrier ring made of a first material and having fitting elements for fitting the carrier ring on the polishing apparatus; and

a bearing ring made of a plastic material, arranged concentrically on the carrier ring, the bearing ring resting with a first front side on a polishing surface of the polishing apparatus and being held on its side axially opposed to the first front side releasably, non-rotatably, with a positive and/or frictional connection and without adhesive on the carrier ring;

the first material having a higher rigidity than the plastic material of the bearing ring.

2. The retaining ring in accordance with claim 1, wherein the releasable, non-rotatable, positive and/or frictional connection of bearing ring and carrier ring is made in the area of an outer circumferential surface of the bearing ring.

3. The retaining ring according to claim 2, wherein the bearing ring has adjacent to the side of the carrier ring a step set back from the circumference and following the circumference for receiving the carrier ring, and the outer circumferential surface for establishing the positive and/or frictional connection is a circumferential surface of the step.

4. The retaining ring according to claim 3, wherein the carrier ring with its outer circumferential surface is substantially in alignment with the outer circumferential surface of the bearing ring.

5. The retaining ring according to claim 3, wherein the bearing ring has a flange extending around the circumference, projecting radially outwardly and enlarging the bearing surface of the front side of this ring.

6. The retaining ring according to claim 1, wherein, in the joined state, the bearing ring and the carrier ring lie surface-to-surface against one another in predetermined surface portions, and the bearing ring and the carrier ring have complementary projections and recesses for centering the bearing ring and the carrier ring.

7. The retaining ring according to claim 6, wherein the surface portions in which carrier ring and bearing ring lie surface-to-surface against one another have a radial orientation.

8. The retaining ring according to claim 6, wherein the complementary projections and recesses of bearing ring and carrier ring are arranged on the surface portions on which carrier ring and bearing ring lie against one another.

9. The retaining ring according to claim 8, wherein the projections and recesses of bearing ring and carrier ring are connectable with a press fit.

10. The retaining ring according to claim 1, wherein the bearing ring has on its outer circumference a circumferential collar pointing in axial direction away from the first front side, lying against the outer circumferential surface of the carrier ring and covering the carrier ring over substantially the entire surface thereof.

11. The retaining ring according to claim 1, wherein the carrier ring has on its surface portion contacting the bearing ring a ring groove having a substantially axially parallel wall with a threaded section thereon, and the bearing ring has on its side axially opposed to the first front side one or several projections arranged complementarily to the ring groove and having a threaded section of complementary design to the threaded section of the axially parallel wall of the groove.

12. The retaining ring according to claim 1, wherein the bearing ring and carrier ring are provided with cooperating detent means which, when the rings are in the fitted state, form a detent connection and secure the rings against axially acting forces in the fitted state.

13. The retaining ring according to claim 12, wherein the detent connection is designed as securing means against rotation.

14. The retaining ring according to claim 1, wherein the carrier ring and the bearing ring have surface portions of complementary design with which they lie against one another in the fitted state, and the surface portions have projections and recesses of complementary design for joining the rings by a shrinking-in or shrinking-on process.

15. The retaining ring according to claim 1, wherein the bearing ring has on its circumferential surface a ring groove opening radially outwardly, and the carrier ring comprises several ring segments including a flange portion of essentially complementary design to the ring groove and one or more fitting sections which are provided for fitting the carrier ring on the polishing apparatus in axial direction from the side facing away from the bearing surface of the bearing ring.
16. The retaining ring according to claim 15, wherein the fitting sections comprise elements projecting axially from the flange portions.
17. The retaining ring according to claim 16, wherein the groove has in its groove wall facing axially away from the bearing surface of the bearing ring recesses in which the elements of the fitting sections are engageable radially from the outside.
18. The retaining ring according to claim 1, wherein the bearing ring and the carrier ring have complementary surfaces which in the fitted state are in alignment with one another and form between them a ring channel which is sealed off by ring-shaped sealing elements, and the carrier ring has a closable opening accessible from the outside and leading into the ring channel for evacuation of the ring channel.
19. The retaining ring according to claim 1, wherein the bearing ring and the carrier ring have on at least one surface portion on which these rings lie against one another a cavity formed by recesses in both the surface of the bearing ring and the surface of the carrier ring and fillable with a curable material.
20. The retaining ring according to claim 1, wherein the bearing ring and the carrier ring are rotationally fixedly connected to one another by a bolt engaging recesses on both the bearing ring and the carrier ring.
21. The retaining ring according to claim 20, wherein the bolt is a threaded bolt, and the recess has an internal threaded section complementary to the outer thread of the threaded bolt.

22. The retaining ring according to claim 20, wherein the bolt is insertable in axial or radial direction into the recess.
23. The retaining ring according to claim 1, wherein the plastic material comprises at least one of a thermoplastic material, a thermosetting plastic material and an elastomer.
24. The retaining ring according to claim 23, wherein the plastic material is a reinforced plastic material.
25. The retaining ring according to claim 24, wherein the plastic material is a fiber-reinforced, plastic material.
26. The retaining ring according to claim 23, wherein abrasion-reducing and/or wear-reducing additives are admixed with the plastic material.
27. The retaining ring according to claim 1, wherein the bearing ring comprises at least two layers or components.